

PATENT COOPERATION TREATY

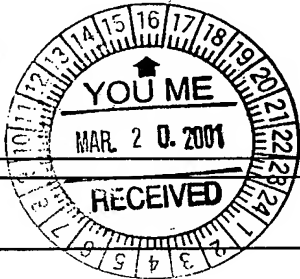
10/070477

From the INTERNATIONAL SEARCHING AUTHORITY

To:

KIM, Won Ho
YOU ME Patent & Law Firm

702, Teheran Bd., 825-33,
Yoksam-dong, Kangnam-ku
Seoul 135-080
Republic of Korea



PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing
(day/month/year) 9 March 2001 (09.03.01)

Applicant's or agent's file reference
OPP000432KR

IMPORTANT NOTIFICATION

International application No.
PCT/ KR 00/00956

International filing date (day/month/year)
25 August 2000 (25.08.00)

Applicant

Dongjin Semichem Co., Ltd. et al.

1. ☒ The applicant is hereby notified that the international search report has been established and is transmitted herewith.

Filing of amendments and statements under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.
3. ☐ **With regard to the protest** against payment of (an) initial fee(s) under Rule 40.2, the applicant is notified that:
- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the text of both the protest decision thereon to the designated Offices
 - ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.
4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis. 1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 month from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the IPEA/AT
Austrian Patent Office
Kohlmarkt 8-10
A-1014 Vienna
Facsimile No. 1/53424/200

Authorized officer

Koch

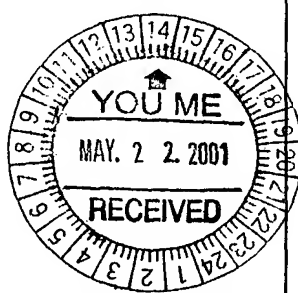
Telephone No. +43 / 1 / 53424 - 450

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:
KIM, Won Ho
YOU ME Patent & Law Firm

702, Teheran Bd., 825-33,
Yoksam-dong, Kangnam-ku
Seoul 135-080
Republic of Korea



PCT

NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing
(day/month/year) 15 May 2001 (15.05.01)

Applicant's or agent's file reference
OPP000432KR

IMPORTANT NOTIFICATION

International application No.
PCT/ KR 00/00956

International filing date (day/month/year)
25 August 2000 (25.08.00)

Priority Date (day/month/year)
7 September 1999 (07.09.99)

Applicant
Dongjin Semichem Co., Ltd. et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/AT
Austrian Patent Office
Kohlmarkt 8-10
A-1014 Vienna
Facsimile No. 1/53424/200

Authorized officer

Wolf

Telephone No. +43 / 1 / 53424 - 450

REC'D 22 MAY 2001

WIPO PCT

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference OPP000432KR	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/KR 00/00956	International filing date (day/month/year) 25 August 2000 (25.08.2000)	Priority Date (day/month/year) 7 September 1999 (07.09.1999)
International Patent Classification (IPC) or national classification and IPC IPC⁷: G03F 7/039		
Applicant Dongjin Semichem Co., Ltd. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examination Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I. ☒ Basis of the opinion
- II. ☐ Priority
- III. ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV. ☐ Lack of unity of invention
- V. ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement
- VI. ☐ Certain documents cited
- VII. ☐ Certain defects in the international application
- VIII. ☒ Certain observations on the international application

Date of submission of the demand 1 December 2000 (01.12.2000)	Date of completion of this report 19 March 2001 (19.03.2001)
Name and mailing address of the IPEA/AT Austrian Patent Office Kohlmarkt 8-10 A-1014 Vienna Facsimile No. 1/53424/200	Authorized officer PUSTERER Telephone No. 1/53424/311

Form PCT/IPEA/409 (cover sheet) (July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/RR 00/00956

I. Basis of the report

1. With regard to the elements of the international application:*

☒ the international application as originally filed

☐ the description:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____.

☐ the claims:

pages _____, as originally filed

pages _____, as amended (together with any statement) under Article 19

pages _____, filed with the demand

pages _____, filed with the letter of _____.

☐ the drawings:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____.

☐ the sequence listing part of the description:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____.

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____.

☐ the claims, Nos. _____.

☐ the drawings, sheets/fig _____.

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as „originally filed“ and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/JP 00/00956

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement	Novelty (N)	Claims 1-6	YES
		Claims	NO
	Inventive step (IS)	Claims 1-6	YES
		Claims	NO
	Industrial applicability (IA)	Claims 1-6	YES
		Claims	NO

Citations and explanations (Rule 70.7)

The following documents have been considered for the purposes of this Search Report:

D1: US 5443690 A
D2: US 5679495 A
D3: US 5556734 A
D4: JP 05 113667 A
D5: US 5492793 A
D6: EP 0786701 A1
D7: EP 0877294 A1
D8: US 5773191 A
D9: EP 0793144 A2

The subject-matter of claims 1 to 6 is new and can be considered inventive, because the prior art do not teach or fairly suggest a terpolymer represented by the general formula 1 comprising vinylphenol, tert.butyl-(metha)acrylate and the third monomer for a chemically amplified resist. Additionally the claimed application can undoubtedly be industrially applied. Therefore the present application meets the requirements of Article 33 (2)-(4) PCT.

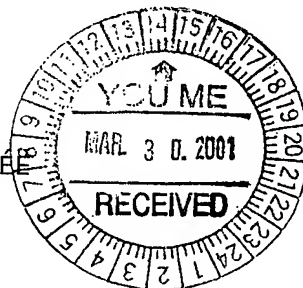
PCT

NOTICE INFORMING THE APPLICANT OF THE
COMMUNICATION OF THE INTERNATIONAL
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:

KIM, Won-Ho
825-33 Teheran Bldg.
Yoksam-dong
Kangnam-Ku
Seoul 135-080
RÉPUBLIQUE DE CORÉE

Date of mailing (day/month/year) 15 March 2001 (15.03.01)		
Applicant's or agent's file reference OPP000432KR		IMPORTANT NOTICE
International application No. PCT/KR00/00956	International filing date (day/month/year) 25 August 2000 (25.08.00)	
Applicant DONGJIN SEMICHEM CO., LTD. et al		

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
AU,KP,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:
AE,AG,AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,BZ,CA,CH,CN,CR,CU,CZ,DE,DK,DM,DZ,EA,EE,EP,ES,
FI,GB,GD,GE,GH,GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MA,MD,MG,MK,
MN,MW,MX,MZ,NO,NZ,OA,PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,TZ,UA,UG,UZ,VN,YU,
The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).
3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on
15 March 2001 (15.03.01) under No. WO 01/18603

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer J. Zahra
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.83.38

PCT REQUEST

OPP000432KR

Original (for SUBMISSION) - printed on 25.08.2000 09:46:12 AM

0	For receiving Office use only	
0-1	International Application No.	
0-2	International Filing Date	
0-3	Name of receiving Office and "PCT International Application"	
0-4	Form - PCT/RO/101 PCT Request	
0-4-1	Prepared using	PCT-EASY Version 2.91 (updated 01.07.2000)
0-5	Petition The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	Korean Industrial Property Office (RO/KR)
0-7	Applicant's or agent's file reference	OPP000432KR
I	Title of invention	POLYMER FOR CHEMICALLY AMPLIFIED RESIST AND A RESIST COMPOSITION USING THE SAME
II	Applicant	
II-1	This person is:	applicant only
II-2	Applicant for	all designated States except US
II-4	Name	DONGJIN SEMICHEM CO., LTD.
II-5	Address:	472-2 Gajwa-dong Seo-ku 404-250 Incheon-city Republic of Korea
II-6	State of nationality	KR
II-7	State of residence	KR
II-8	Telephone No.	82-339-353-6340
II-9	Facsimile No.	82-339-353-8309
III-1	Applicant and/or inventor	
III-1-1	This person is:	applicant and inventor
III-1-2	Applicant for	US only
III-1-4	Name (LAST, First)	KIM, Deog-Bae
III-1-5	Address:	625-3 Yodang-ri, Yanggam-myeon, Hwaseong-kun 445-931 Kyungki-do Republic of Korea
III-1-6	State of nationality	KR
III-1-7	State of residence	KR

PCT REQUEST

Original (for SUEMISSION) - printed on 25.08.2000 09:46:12 AM

III-2	Applicant and/or inventor	
III-2-1	This person is:	applicant and inventor
III-2-2	Applicant for	US only
III-2-4	Name (LAST, First)	KIM, Hyun-Jin
III-2-5	Address:	625-3 Yodang-ri, Yanggam-myeon, Hwaseong-kun 445-931 Kyungki-do Republic of Korea
III-2-6	State of nationality	KR
III-2-7	State of residence	KR
III-3	Applicant and/or inventor	
III-3-1	This person is:	applicant and inventor
III-3-2	Applicant for	US only
III-3-4	Name (LAST, First)	CHOI, Yong-Joon
III-3-5	Address:	625-3 Yodang-ri, Yanggam-myeon, Hwaseong-kun 445-931 Kyungki-do Republic of Korea
III-3-6	State of nationality	KR
III-3-7	State of residence	KR
III-4	Applicant and/or inventor	
III-4-1	This person is:	applicant and inventor
III-4-2	Applicant for	US only
III-4-4	Name (LAST, First)	CHUNG, Yoon-Sik
III-4-5	Address:	625-3 Yodang-ri, Yanggam-myeon, Hwaseong-kun 445-931 Kyungki-do Republic of Korea
III-4-6	State of nationality	KR
III-4-7	State of residence	KR
IV-1	Agent or common representative; or address for correspondence	
	The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	agent
IV-1-1	Name (LAST, First)	KIM, Won-Ho
IV-1-2	Address:	Teheran Bldg., 825-33, Yoksam-dong, Kangnam-Ku 135-080 Seoul Republic of Korea
IV-1-3	Telephone No.	82-2-3458-0700
IV-1-4	Facsimile No.	82-2-553-5254
IV-1-5	e-mail	email@youme.com

PCT REQUEST


Original (for SUBMISSION) - printed on 25.08.2000 09:46:12 AM

V	Designation of States	
V-1	Regional Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AP: GH GM KE LS MW MZ SD SL SZ TZ UG ZW and any other State which is a Contracting State of the Harare Protocol and of the PCT EA: AM AZ BY KG KZ MD RU TJ TM and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT EP: AT BE CH&LI CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE and any other State which is a Contracting State of the European Patent Convention and of the PCT OA: BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG and any other State which is a member State of OAPI and a Contracting State of the PCT
V-2	National Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH&LI CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
V-5	Precautionary Designation Statement In addition to the designations made under items V-1, V-2 and V-3, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except any designation(s) of the State(s) indicated under item V-6 below. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit.	
V-6	Exclusion(s) from precautionary designations	NONE
VI-1	Priority claim of earlier national application	
VI-1-1	Filing date	07 September 1999 (07.09.1999)
VI-1-2	Number	1999-37772
VI-1-3	Country	KR
VII-1	International Searching Authority Chosen	Austrian Patent Office (ISA/AT)

PCT REQUEST

OPP000432KR

Original (for SUBMISSION) - printed on 25.08.2000 09:46:12 AM

VIII	Check list	number of sheets	electronic file(s) attached
VIII-1	Request	4	-
VIII-2	Description	25	-
VIII-3	Claims	6	-
VIII-4	Abstract	1	abstract.txt
VIII-5	Drawings	0	-
VIII-7	TOTAL	36	
	Accompanying items	paper document(s) attached	electronic file(s) attached
VIII-8	Fee calculation sheet	✓	-
VIII-9	Separate signed power of attorney	✓	-
VIII-12	Priority document(s)	Item(s) VI-1	-
VIII-16	PCT-EASY diskette	-	diskette
VIII-18	Figure of the drawings which should accompany the abstract		
VIII-19	Language of filing of the international application	English	
IX-1	Signature of applicant or agent		
IX-1-1	Name (LAST, First)		
		KIM, Won-Ho	

FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	
10-2	Drawings:	
10-2-1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/AT
10-6	Transmittal of search copy delayed until search fee is paid	

FOR INTERNATIONAL BUREAU USE ONLY

11-1	Date of receipt of the record copy by the International Bureau	
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NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under Article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*, a publication of WIPO.

In these Notes, "Article," "Rule" and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended ?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Preliminary Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When ? Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments ?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How ? Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments ?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Commissioner
US Department of Commerce
United States Patent and Trademark
Office, PCT
2011 South Clark Place Room
CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE
in its capacity as elected Office

Date of mailing: 15 March 2001 (15.03.01)	
International application No.: PCT/KR00/00956	Applicant's or agent's file reference: OPP000432KR
International filing date: 25 August 2000 (25.08.00)	Priority date: 07 September 1999 (07.09.99)
Applicant: KIM, Deog-Bae et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International preliminary Examining Authority on:
01 December 2000 (01.12.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<p>The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No.: (41-22) 740.14.35</p>	<p>Authorized officer:</p> <p>J. Zahra</p> <p>Telephone No.: (41-22) 338.83.38</p>
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(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
15 March 2001 (15.03.2001)

PCT

(10) International Publication Number
WO 01/18603 A2

- (51) International Patent Classification⁷: **G03F**
- (21) International Application Number: **PCT/KR00/00956**
- (22) International Filing Date: **25 August 2000 (25.08.2000)**
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (30) Priority Data:
1999/37772 7 September 1999 (07.09.1999) **KR**
- (71) Applicant (for all designated States except US):
DONGJIN SEMICHEM CO., LTD. [KR/KR]; 472-2 Gajwa-dong, Seo-ku, Incheon-city 404-250 (KR).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **KIM, Deog-Bae [KR/KR]; 625-3 Yodang-ri, Yanggam-myeon, Hwaseong-kun, Kyungki-do 445-931 (KR). KIM, Hyun-Jin [KR/KR]; 625-3 Yodang-ri, Yanggam-myeon, Hwaseong-kun, Kyungki-do 445-931 (KR). CHOI, Yong-Joon [KR/KR]; 625-3 Yodang-ri, Yanggam-myeon, Hwaseong-kun, Kyungki-do 445-931 (KR). CHUNG, Yoon-Sik [KR/KR]; 625-3 Yodang-ri, Yanggam-myeon, Hwaseong-kun, Kyungki-do 445-931 (KR).**
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- (81) Designated States (national): **AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.**
- (84) Designated States (regional): **ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).**
- Published:**
— Without international search report and to be republished upon receipt of that report.
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

WO 01/18603 A2

(54) Title: **POLYMER FOR CHEMICALLY AMPLIFIED RESIST AND A RESIST COMPOSITION USING THE SAME**

(57) Abstract: The present invention relates to a polymer for a chemically amplified resist and a resist composition using the same. The present invention provides a polymer represented by the Formula (1) and a chemically resist composition for extreme ultraviolet light comprising the same. The chemically amplified resist composition comprising the polymer represented by the formula (1) of the present invention responds to mono wavelength in a micro-lithography process and can embody a micro-pattern of high resolution on a substrate.

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- (51) International Patent Classification⁷: **G03F 7/039**
- (21) International Application Number: **PCT/KR00/00956**
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- (25) Filing Language: English
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1999/37772 7 September 1999 (07.09.1999) **KR**
- (71) Applicant (for all designated States except US):
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- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **KIM, Deog-Bae** [KR/KR]; 625-3 Yodang-ri, Yanggam-myeon, Hwaseong-kun, Kyungki-do 445-931 (KR). **KIM, Hyun-Jin** [KR/KR]; 625-3 Yodang-ri, Yanggam-myeon, Hwaseong-kun, Kyungki-do 445-931 (KR). **CHOI, Yong-Joon** [KR/KR]; 625-3 Yodang-ri, Yanggam-myeon, Hwaseong-kun, Kyungki-do 445-931 (KR). **CHUNG, Yoon-Sik** [KR/KR]; 625-3 Yodang-ri, Yanggam-myeon, Hwaseong-kun, Kyungki-do 445-931 (KR).
- (74) Agent: **KIM, Won-Ho**; 825-33 Teheran Bldg., Yoksam-dong, Kangnam-Ku, Seoul 135-080 (KR).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report
- (88) Date of publication of the international search report:
20 September 2001
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: POLYMER FOR CHEMICALLY AMPLIFIED RESIST AND A RESIST COMPOSITION USING THE SAME

(57) Abstract: The present invention relates to a polymer for a chemically amplified resist and a resist composition using the same. The present invention provides a polymer represented by the formula (1) and a chemically resist composition for extreme ultraviolet light comprising the same. The chemically amplified resist composition comprising the polymer represented by the formula (1) of the present invention responds to mono wavelength in a micro-lithography process and can embody a micro-pattern of high resolution on a substrate.

WO 01/18603 A3

INTERNATIONAL SEARCH REPORT

International Publication No.
PCT/KR/00956

CLASSIFICATION OF SUBJECT MATTER

IPC⁷: G03F 7/039

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁷: G03C, G03F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, PAJ, WPI, CAS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5443690 A (TAKECHI et al.) 22 August 1995 (22.08.95) claims 1,4,5, examples.	1-6
A	US 5679495 A (YAMACHIKA et al.) 21 October 1997 (21.10.97) the whole document.	1-6
A	US 5556734 A (YAMACHIKA et al.) 17 September 1996 (17.09.96) the whole document.	1-6
A	JP 05113667 A (MITSUBISHI ELECTRIC CORP.) 7 May 1993 (07.05.93) (abstract). World Patents Index (online). London. U.K.: Derwent Publication, Ltd. (retrieved on 2000-11-10) Retrieved from: Questel/Orbit, Paris, France. DW 199323, Accession No. 1993-185601.	1-6
A	US 5492793 A (BREYTA et al.) 20 February 1996 (20.02.96) claims 1,5, examples 1-4.	1-6

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

„A“ document defining the general state of the art which is not
considered to be of particular relevance

„E“ earlier application or patent but published on or after the international
filing date

„L“ document which may throw doubts on priority claim(s) or which is
cited to establish the publication date of another citation or other
special reason (as specified)

„O“ document referring to an oral disclosure, use, exhibition or other
means

„P“ document published prior to the international filing date but later than
the priority date claimed

„T“ later document published after the international filing date or priority
date and not in conflict with the application but cited to understand
the principle or theory underlying the invention

„X“ document of particular relevance; the claimed invention cannot be
considered novel or cannot be considered to involve an inventive step
when the document is taken alone

„Y“ document of particular relevance; the claimed invention cannot be
considered to involve an inventive step when the document is
combined with one or more other such documents, such combination
being obvious to a person skilled in the art

„&“ document member of the same patent family

Date of the actual completion of the international search

16 November 2000 (16.11.2000)

Date of mailing of the international search report

9 March 2001 (09.03.2001)

Name and mailing address of the ISA/AT

Austrian Patent Office
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INTERNATIONAL SEARCH REPORT

International Application No.

PCT/KR 00/00956

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0786701 A1 (NIPPON ZEON CO., Ltd.) 30 July 1997 (30.07.97) the whole document.	1-6
A	EP 0877294 A1 (NIPPON ZEON CO., LTD.) 11 November 1988 (11.11.88) claims 1,6,8-10, examples, page 5, line 12.	1-6
A	US 5773191 A (PADMANABAN et al.) 30 June 1998 (30.06.98) claims 1,18,19, examples.	1-6
A	EP 0793144 A2 (JAPAN SYNTHETIC RUBBER CO., LTD.) 3 September 1997 (03.09.97) the whole document.	1-6

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

P KR 00/00956

Patent document cited in search report			Publication date	Patent family members(s)			Publication date
EP	A1	786701	30-07-1997	JP	A2	8211613	20-08-1996
EP	A4	786701	12-08-1998	US	A	6010826	04-01-2000
				WO	A1	9612216	25-04-1996
				JP	A2	8194308	30-07-1996
				JP	A2	8254828	01-10-1996
EP	A2	793144	03-09-1997	DE	C0	69703902	22-02-2001
EP	A3	793144	06-05-1998	JP	A2	9292709	11-11-1997
EP	B1	793144	17-01-2001	US	A	5962180	05-10-1999
EP	A1	877294	11-11-1998	WO	A1	9727515	31-07-1997
EP	A4	877294	29-09-1999				
JP	A2	5113667	07-05-1993	JP	B2	2964733	18-10-1999
US	A	5443690	22-08-1995	DE	A1	4409220	17-11-1994
				JP	A2	6324494	25-11-1994
US	A	5492793	20-02-1996	DE	C0	69322946	18-02-1999
				DE	T2	69322946	12-08-1999
				EP	A2	605089	06-07-1994
				EP	A3	605089	21-09-1994
				EP	B1	605089	07-01-1999
				JP	A2	6266112	22-09-1994
				US	A	5625020	29-04-1997
US	A	5556734	17-09-1996	DE	C0	69401906	10-04-1997
				DE	T2	69401906	03-07-1997
				EP	A1	660187	28-06-1995
				EP	B1	660187	05-03-1997
				JP	A2	7230169	29-08-1995
US	A	5679495	21-10-1997	JP	A2	7209868	11-08-1995
				JP	B2	3116751	11-12-2000
US	A	5773191	30-06-1998	EP	A1	756203	29-01-1997
				JP	A2	9043837	14-02-1997

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference OPP000432KR	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/KR 00/00956	International filing date (day/month/year) 25 August 2000 (25.08.2000)	Priority Date (day/month/year) 7 September 1999 (07.09.1999)
International Patent Classification (IPC) or national classification and IPC IPC⁷: G03F 7/039		
Applicant Dongjin Semichem Co., Ltd. et al.		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examination Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u> 4 </u> sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of <u> </u> sheets.</p> <p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> I. <input checked="" type="checkbox"/> Basis of the opinion II. <input type="checkbox"/> Priority III. <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV. <input type="checkbox"/> Lack of unity of invention V. <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI. <input type="checkbox"/> Certain documents cited VII. <input type="checkbox"/> Certain defects in the international application VIII. <input checked="" type="checkbox"/> Certain observations on the international application 		
Date of submission of the demand 1 December 2000 (01.12.2000)	Date of completion of this report 19 March 2001 (19.03.2001)	
Name and mailing address of the IPEA/AT Austrian Patent Office Kohlmarkt 8-10 A-1014 Vienna Facsimile No. 1/53424/200	Authorized officer <div style="text-align: center; font-weight: bold; font-size: 1.2em;">PUSTERER</div> Telephone No. 1/53424/311	

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/KR 00/00956

I. Basis of the report

1. With regard to the elements of the international application:*

☒ the international application as originally filed

☐ the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____.

☐ the claims:

pages _____, as originally filed
pages _____, as amended (together with any statement) under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____.

☐ the drawings:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____.

☐ the sequence listing part of the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____.

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____.

☐ the claims, Nos. _____.

☐ the drawings, sheets/fig _____.

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as „originally filed“ and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/KR 00/00956

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement	Novelty (N)	Claims 1-6	YES
		Claims	NO
	Inventive step (IS)	Claims 1-6	YES
		Claims	NO
	Industrial applicability (IA)	Claims 1-6	YES
		Claims	NO

Citations and explanations (Rule 70.7)

The following documents have been considered for the purposes of this Search Report:

D1: US 5443690 A
D2: US 5679495 A
D3: US 5556734 A
D4: JP 05 113667 A
D5: US 5492793 A
D6: EP 0786701 A1
D7: EP 0877294 A1
D8: US 5773191 A
D9: EP 0793144 A2

The subject-matter of claims 1 to 6 is new and can be considered inventive, because the prior art do not teach or fairly suggest a terpolymer represented by the general formula 1 comprising vinylphenol, tert.butyl-(metha)acrylate and the third monomer for a chemically amplified resist. Additionally the claimed application can undoubtedly be industrially applied. Therefore the present application meets the requirements of Article 33 (2)-(4) PCT.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/KR 00/00956

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

In claims 1 and 3 R3 cannot be CH₂NH.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/KR 00/00956

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

In claims 1 and 3 R3 cannot be CH₂NH.